

Moderating Effects of Student Motivation on the Relationship between Learning Styles and Student Engagement

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Abstract: This research examined both the relationship and the effects of learning styles and student engagement at three selected *Universiti Teknologi MARA*, (UiTM) Malaysia state campuses using the VARK learning style model. The effects of students' learning styles and their relationships to classroom engagement were analyzed. Three categories of students' majors which were Social Science (SS), Technical Science (TS) and Pure Science (PS) were segregated to identify the moderating effects of student motivation on the relationship between learning styles and student engagement. The results revealed that only visual learning style was found to influence all three dimensions (behavioral, cognitive and emotional) elements of student engagement. These results also showed that visual learners had higher classroom engagement as opposed to both auditory and kinesthetic learners. It was also reported that all elements of student motivation (achievement, recognition, relationship with peers and relationship with lecturers) did significantly moderate the relationship between learning styles and student engagement. It is recommended that instructors should employ varieties of teaching methods to encourage student engagement according to their fields of study. It is further suggested that motivation should be enriched among students to yield higher student classroom engagement.

Keywords: Homogenous Group, Learning Styles, Student Engagement, University Students,

1. Introduction

The definition of learning style varies as there is no one standard "globally-accepted" connotation for it. The development of literature and the concept of learning style are operationalized and understood in a variety of different ways. Becker, Tehoe and Tennent (2007) reported that researchers generally utilize the concept of learning style in both educational and organizational settings. Sadler-Smith (1996) pointed to what is termed as the lack of a generally accepted model or understanding of the concept of learning styles in the literature. Sadler-Smith (1996) however defined learning style as a process that makes learners become aware of their own learning style and how to accommodate it in the learning environment so that significant benefits to learning outcomes can be generated. Grasha (1996) defined learning style simply as an individual's preferred way of learning. Doherty and Maddux (2002) defined it as a component which consists of three major constructs which were characteristic cognitive, affective, and psychological behaviors. These constructs served as reasonably stable indicators of how students think, interact with, and respond to their own learning environment.

It was also reported that the trend of decreasing student satisfaction at all levels has drawn attention to the concept of student engagement (Omer, 2011). Kuh (2001) reported that one of the important factors for student learning and personal development is students' level of engagement coupled with academic meaningful activities. Perie, Rebecca, Anthony, Lutkus (2005) agreed that

students' low engagement with academic activities would contribute to their dissatisfaction, negative experience, and dropping out of school. In fact, low engagement in high-stakes examination environments put students at-risk of unnecessary stress (Supramaniam & Nazer, 2016) and leaving school (Arumugam & Supramaniam (2016). Xerri, Radford, Shacklock, and Kate (2018) reported that student engagement in academic activities is a critical factor causative to the overall success of students studying in higher education institutions. They further stated that instructors, however, are still in the dark in finding the factors influencing student engagement in academic activities.

The quality of higher education is continuously expanding simultaneously in many countries and it has been a trend over the past few decades, resulting in higher learning accessibility for students. According to Dian-Fu and Yeh (2012), one common crucial problem that is still haunting countries around the globe is the way to improve the quality of education when there is continuous increase in enrollment rates. Recent news revealed the truth on how higher education institutions are facing issues in students' disengagement instead of engagement (Kazmi, 2010; McInnis, 2001). In fact, research in Australia and the United States found the declining level of engagement in higher education, in which undergraduates are less involved with institutions, or not as good as the earlier generation (Teoh, Maria, Samsilah & Shaffe, 2013).

In fact, this issue seems to be quite similar in Malaysia as previous research on student engagement in Malaysian public university appeared to be scarce (Teoh et. al, 2013; Teoh, 2019). Nevertheless, looking into the constructs of student engagement such as student-faculty interaction and active learning, the same picture of disengagement seems to linger as well among Malaysian students (Teoh et al, 2013). According to Thang and Azarina (2007), the majority of students in both public and private universities in Malaysia have generally experienced teacher-centered learning and faced the lack of personal autonomy. It is quite worrisome for the academics to know that less than 20% of students had actually asked questions to the lecturers during classes (Zainal Abidin Sayadin, 2007).

Besides, Dasari (2009) and Tani (2005) also found that Asian students have been distinctively marked to be having a low level of in-class participation, perhaps disengagement. It was reported that motivation was associated with engagement (Madoxx, 2010), until however, quite recently that there were only a handful of studies that highlighted the relationship between students' motivation, engagement and learning outcomes with GPA as a measure of their academic achievement (Tzu-Ling Hsieh, 2014). Hence the objectives of this research are to: (1) to investigate the effects of learning styles (Visual, Auditory, Kinesthetic) on student engagement (Behavioral, Emotional, Cognitive), and (2) to determine the moderating roles of student motivation towards the relationship between learning styles and student engagement. There are a few limitations warrant discussion as they have potential to inhibit findings. Firstly, this study was limited to only Universiti Teknologi MARA (UiTM) students at three selected campuses only. Second, the subjects under investigation were from a homogenous group; therefore, extra caution must be exercised when making an inference of the findings of this study. Lastly, the researcher did not include the reading and writing element in the VARK model because it was assumed that university students were able to read and write.

2. Literature Review

According to Everson and Michna (2004), in order to improve students' engagement, numerous interventions must be present. It is learnt that most of them are instructional solutions for instance, engaging and utilizing various teaching practices as well as designing a variety of learning environments. In fact, it was reported that instructional practices can be controlled only by the educators; thus this makes them responsible for the planning and execution of many classroom instructions, preparations and learning environments (Ginns & Ellis, 2007). Nevertheless, it is worth to note the pact of researchers in both secondary and higher education levels about the importance of engaging students with activities for academic purposes, aiming for their personal development and learning in both traditional and technologically enhanced learning environments. Studies showed that students with learning engagement will actually gain more enjoyable classroom experience, learn more and perform better academically (Park, 2003).

One of the learning styles commonly used is the VARK model, developed by Fleming (1987). The model incorporates four learning styles which are Vision, Auditory, Reading and Kinesthetic. Weinstein and Ryan (2010) conveyed that conventional perception dictates that if the learner is primarily visual, teachers should show them lots of pictures. However, if the learner is primarily

auditory, open discussion should be promoted and if the learner is primarily kinesthetic, one should give them the opportunities to practice by maximizing hands-on experience. Nonetheless, this research explored only three learning styles most commonly used by the general university student population which were Vision, Auditory and Kinesthetic. Acknowledging that students learn differently, VARK model simply classified how a particular student uses one component of the four-pie to assist them in the learning process.

In reality, the student engagement concept has been reviewed in the literature for more than 70 years (Kuh, 2009) and it has grown to be crucial in serving two-fold objectives for higher education which are personal and institution development (Teoh et. al. 2013). According to Fredericks, Blumenfeld and Paris (2004), there are three types of engagement which are behavioral, emotional and cognitive engagement. Behavioral engagement can be referred to as students' involvement in social and academic activities which leads to positive academic outcomes. Emotional engagement on the other hand, concerns the relationships and reactions to teachers, peers and staff that will enhance the love for learning including emotions such as humour (Salmee & Mohd Arif, 2018). Cognitive engagement is about concepts and deep learning.

In relation to the above, the learning styles, incorporated with behavioral, emotional and cognitive engagement have been found as crucial elements to be directly influential towards overall students' engagement (Hashim, Aris and Chan, 2019). Promoting Empathy Using Design Thinking In Project-Based Learning And As A Classroom Culture. *Asian Journal of University Education*, 15(3), 14-23. For example, visual learners prefer what can be seen in diagrams and flowcharts. They prefer the information conveyed to them in printed form and respond well with pictures. They explain better using pictures or diagrams and prefer to take notes. They prefer handouts and rely most on textbooks and considered as list keepers. Aural learners on the other hand, concentrate on what is communicated. These learners prefer listening to tapes or discussing topics, enjoy talking about their answers and perhaps may appreciate studying within group settings. Kinesthetic learners enjoy learning through experience and practice or touch. They benefit from having lived through the experience to learn it. Lab work in the medical field is a way that kinesthetic learners benefit the most. Student engagement is considered an important predictor of student achievement, but few researchers have attempted to derive a valid and reliable measure of college student engagement in particular courses. (Handelsman, Briggs, Sullivan, Towler (2005).

2.1 Motivation

As a moderator for this study, motivation can be defined as an internal condition that functions to activate and direct the behavior (Kleinginna & Kleinginna, 1981). Herzberg has come out with a two-factor theory which encompasses motivation and hygiene theory. Motivation factors consist of achievement and recognition; it highlights positive academic attitudes which fulfill the desire for self-actualization. In addition, hygiene factors consist of relationships with lecturers and peers, where the absence of these relationships may prevent satisfaction among learners and may lead to poor academic performance. Within this context, student's learning motivation and engagement behaviors is a key to improving teaching and learning and thus enhancing the quality of higher education. Fredricks et. al. (2004) stated that there is a lack of understanding about how learning motivation leads to increase in engagement behaviors that may influence subsequent achievements.

2.2 Conceptual Framework

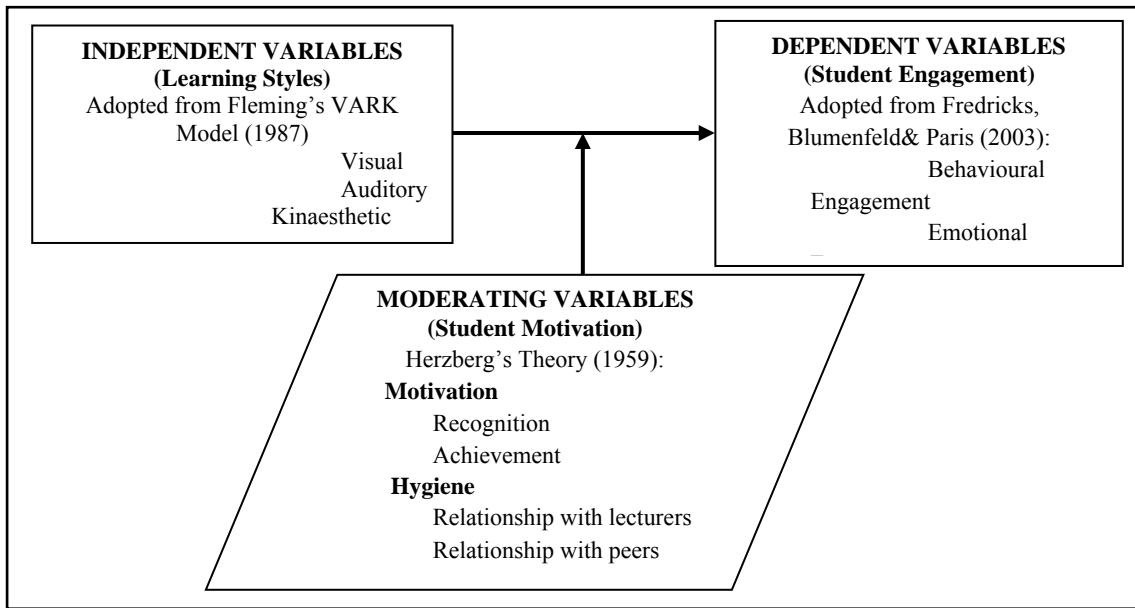


Fig 1: Conceptual framework for moderating effects of student motivation on the relationship between learning styles and student engagement

3. Methodology

A descriptive quantitative survey was applied to study the moderating effects of motivation on the relationship between learning styles and student engagement among UiTM students. Convenience Sampling technique was used, consisting of students from three selected UiTM state campuses which were UiTM Puncak Alam, Selangor, UiTM Kelantan Branch and UiTM Tapah, Perak. A set of questionnaires was used as a tool to collect data on students' engagement divided into four sections. Section A was for respondents' demographic profiles, section B was for students' learning style, section C was to gather respondents' motivation and finally section D was to gather the dependent variable which was student engagement.

Inferential statistics were used to analyze the effects of learning styles (Visual, Auditory, Kinesthetic) on student engagement (Behavioral, Emotional, Cognitive) and the moderating roles of student motivation towards the relationship between learning styles and student engagement. A Pearson Product Moment Correlation Coefficient (Pearson r) was applied to determine the relationships between and among variables, while the multiple regression analysis was used to ascertain the effects of students' learning styles towards their classroom engagement. Finally, the hierarchical regressions were applied to measure the moderating effects of student motivation on the relationship between learning style and student engagement. The total number of questionnaires distributed was 180 in which 60 students from each campus were conveniently selected. 154 questionnaires were returned and all were found to be usable. According to Hair, Black and Babin (2010) the number of respondents is considered appropriate and acceptable for the analysis which is greater than 100 samples.

4. Findings and Discussion

4.1 Research Objective 1

Research Objective 1 is to investigate the effect of learning styles (Visual, Auditory, Kinesthetic) on student engagement (Behavioral, Emotional and Cognitive). Table 1 shows the regression result between learning styles towards student engagement.

Table 1 The regression result between learning styles towards student engagement.

Variables		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Behavior	(Constant)	.618	.450		1.373	.172
	Visual	.537	.070	.543	7.697	.000
	Auditory	.156	.081	.139	1.936	.055
	Kinesthetic	.146	.096	.100	1.517	.131
Emotional/Affective	(Constant)	.722	.466		1.549	.123
	Visual	.614	.072	.592	8.496	.000
	Auditory	.084	.084	.071	1.004	.317
	Kinesthetic	.135	.100	.088	1.360	.176
Cognitive	(Constant)	-.052	.516		-.101	.919
	Visual	.686	.080	.577	8.584	.000
	Auditory	.205	.093	.152	2.219	.028
	Kinesthetic	.208	.110	.118	1.882	.062

Table 1 reveals the findings of the effects of types of learning styles towards student engagement. It was found that students who used visual learning style had an impact on their classroom engagement significantly on behavior ($\beta=.543$, $p<0.05$). However, auditory and kinesthetic learning styles were found to have no significant influence on student engagement in terms of behavioral. Besides, the study also revealed that visual learning style had significantly influenced student engagement in terms of emotional or affective ($\beta=.592$, $p<0.05$). However, it was found that there was no influence of auditory and kinesthetic learning styles towards emotional or affective student engagement. Finally, results also showed that both visual learning style and auditory learning style had an impact on student engagement from the perspective of cognitive. However, among those two dimensions, visual learning style was found to have the greatest influence on student engagement ($\beta=.577$, $p<0.05$) as compared to auditory learning style ($\beta=.152$, $p<0.05$). Meanwhile, kinesthetic learning style was found to have no effect on cognitive student engagement.

Visual learners are usually dependent learners. In summary, visual learning style was found to have an impact towards all the three dimensions of student engagement. As indicated in Table 1, visual learning style greatly affects student engagement in terms of behavior, emotional and cognitive aspects (54.3%, 59.2% and 57.7% respectively). This finding was supported by Franzoni and Assar (2009) stating that visual learners are keen to engage and share their information in collaborative learning. Furthermore, according to Riazi and Riasati (2007), students with visual learning style preferred to be actively engaged in class activities. They tend to have interactions with other students in the class. Visual learners remember best by seeing information as they can learn new information better when using pictures, charts, graphs, and diagrams. It is important that these learners take notes during a lecture in order to increase their retention of information. These students also exhibit strong visualization skills (Dunn and Dunn, 2005). However, Kassaian (2007) stated that sixty-six university students having either auditory or visual learning styles were more engaged or participated in teaching method environments.

4.2 Research Objective 2

Research Objective 2 is to determine the moderating roles of student motivation towards the relationship between learning styles and student engagement. Table 2 shows the hierarchical regression of moderating roles on student motivation between learning styles and student engagement.

Table 2 The hierarchical regression of moderating roles on student motivation between learning styles and student engagement

Variables	Model 1	Model 2	Model 3
Independent variables			
Visual	.630	.307	.763
Auditory	.134	.032	.249
Kinesthetic	.114	-.002	-.218
Moderating Variable			
Recognition		.513	1.108*
Interaction terms			
Visual x Recognition			-1.046*
Auditory x Recognition			-.415
Kinesthetic x Recognition			.414
R Square	.498	.687	.724
R Square Change	.498	.189	.037
Sig.	.000 ^b	.000 ^c	.000 ^d
Durbin-Watson			1.955
Independent variables			
Visual	.630	.266	.421
Auditory	.134	.066	.527
Kinesthetic	.114	.064	.395
Moderating Variable			
Achievement		.610	1.906*
Interaction terms			
Visual x Achievement			-.430
Auditory x Achievement			-.799*
Kinesthetic x Achievement			-.642
R Square	.498	.710	.748
R Square Change	.498	.212	.038
Sig.	.000	.000	.000
Durbin-Watson			1.894
Independent variables			
Visual	.630	.257	.429
Auditory	.134	.128	.407
Kinesthetic	.114	.092	.860
Moderating Variable			
Relationship with lecturer		.576	2.342*
Interaction terms			
Visual x Relationship with lecturer			-.425
Auditory x Relationship with lecturer			-.522
Kinesthetic x Relationship with lecturer			-1.444*
R Square	.498	.687	.724
R Square Change	.498	.189	.037
Sig.	.000	.000	.000
Durbin-Watson			1.955
Independent variables			
Visual	.630	.437	.938
Auditory	.134	.101	.220
Kinesthetic	.114	.104	.511
Moderating Variable			
Relationship with peers		.360	1.831*
Interaction terms			
Visual x Relationship with peers			-1.028*
Auditory x Relationship with peers			-.275
Kinesthetic x Relationship with peers			-.801
R Square	.498	.584	.630
R Square Change	.498	.086	.046
Sig.	.000	.000	.000
Durbin-Watson			1.942

Dependent Variable: MEAN STUDENT ENGAGEMENT (DV)

*significant p<0.05

Table 2 shows the findings of the hierarchical regression analysis investigating the moderating effects of recognition on the relationship between learning styles and student engagement. Model 1 explained 49.8% of the variance while Model 2 displayed an increment of 18.9% to 68.7% of variance. Model 3 explained 72.4% of variance with 3.7% increment. Besides, it was found that there was a significant moderating influence of recognition on the relationship between learning styles and student engagement ($\beta=1.108$, $p<0.05$). The interaction term between students' recognition and student engagement has strengthened the relationship between visual learning styles and student engagement ($\beta=-1.046$, $p<0.05$). The beta-value suggested the higher the level of recognition, the lower the effects of visual learning styles towards the student engagement.

As for achievement dimension, Model 1 explained 49.8% of the variance while Model 2 explained 71% of the variance with an increment of 21.2%. However, Model 3 explained 74.8% of the variance with only a slight increase of 3.8%. It was also discovered that there was a significant moderating influence of achievement dimension on the relationship between learning styles and student engagement ($\beta=1.906$, $p<0.05$). The interaction between students' achievement and student engagement has strengthened the relationship between auditory learning style and student engagement ($\beta=-.799$, $p<0.05$). The beta-value suggested that the higher the level of achievement (motivation), the lower the effects of auditory learning style towards student engagement.

Next would be on the effect of relationship with lecturer as a moderating variable. Model 1 explained 49.8% of the variance and there was an increment of 18.9% in Model 2, explaining 68.7% of the variance. However, Model 3 explained 72.4% of the variance with a slight increase of 3.7%. Moreover, results found that there was a significant moderating influence of relationship with lecturer on the relationship between learning styles and student engagement ($\beta=-2.342$, $p<0.05$). The interaction term between students' relationship with lecturer and student engagement has strengthened the relationship between kinesthetic learning style and student engagement ($\beta=-1.444$, $p<0.05$). The beta-value suggested that the higher the level of relationship with lecturer, the lower the effects of kinesthetic learning style towards student engagement.

Lastly, explaining the results concerning relationship with peers' dimension. Model 1 explained 49.8% of the variance while Model 2 explained 58.4% of the variance with an increment of 8.6%. There was 4.6% increment in Model 3, explaining 63% of the variance. Furthermore, it was found that there was a significant moderating influence of relationship with peers on the relationship between learning styles and student engagement ($\beta=-1.831$, $p<0.05$). The interaction term between students' relationship with peers and student engagement has strengthened the relationship between visual learning style and student engagement ($\beta=-1.028$, $p<0.05$). Therefore, the beta-value suggested that the higher the level of relationship with peers, the lower the effects of visual learning style towards student engagement.

Student motivation is important towards student engagement especially during the learning process. The greater the students are motivated to learn, the more likely it is to succeed in their actions. Several factors may contribute to student motivation including peers involvement, teacher motivation and skills, and effective use of technology (Francis, 2017). Kauffman & Laundrum (2012) mentioned that although special education students consistently demonstrate the largest and most consistent achievement shortage, those identified with emotional and behavioral disorders display some of the largest gaps in achievement. However, Anderman and Kaplan's (2008) have identified the important role of interpersonal relationships in encouraging student motivation and learning. This has supported the study findings that indicated motivation have significantly moderate the relationships between learning styles and student engagement.

4.3 Conclusion

In a nutshell, this study has discovered that visual learning style has the most impact on the three dimensions of student engagement. However, these findings are expectable because the majority of the students are from Business and Management Faculty which may require them to read a lot in their courses, explaining the reason why visual learning style has the greatest influence towards student engagement. Their familiarity on reading subjects may cause them to perceive that visual learning style will strongly help them to engage in class as compared to other learning styles.

Next, it can be concluded that motivation has significantly moderate the relationship between learning styles and student engagement. Motivation is probably one of the most important factors that educators can consider prioritizing in order to enhance learning. In fact, human beings in general and

students in particular are complex creatures with complex needs and desires. Specifically to students, it is somehow impossible for any learning to voluntarily occur unless the students have consistent motivation. According to Dornyei (1997), motivation provides the primary effort to initiate learning and later as the driving force to sustain the long and often tedious learning process. Besides, high motivation can compensate for considerable limitations both in one's learning conditions and language aptitude.

5. Recommendation

The researchers acknowledged that while this research may lack the generalizability aspect due to the homogenous population of this study, pertinent information and conclusion can be derived. Several recommendations are made to assist future researchers when conducting research of this nature.

Firstly, knowledge of learning style may provide generous information to the student, explaining how they learnt things in a different way than others. It is their responsibility to make sure that they are learning what the best is for themselves, which they must be the center of everything and they are the ones who can solely control it. They need to search for answers to their problems and obtain all the benefits contributed by their unique performances and preferences in their learning styles. Those people will determine their aims and goals, unlike those who are still unsure about their preferences in learning styles. They know what they want to learn and "how." This awareness will change their perspectives on learning new things (Fidan, 1986).

Secondly, it is seldom for students to be able to have definite instruction aimed at their dominant learning style in every circumstance, so teachers should help them to adapt few other learning styles that may suit practicing in other situations as well. It is recommended that educators use a variety of learning methods, and encourage their students to approach different learning methods, rather than try to link specific learning methods to specific learning styles (Loo, 2004). Possibly, it is more beneficial to introduce concepts in various different ways in order to keep the instruction fresh and more engaging.

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